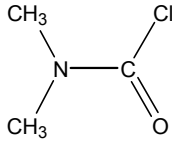
DIMETHYLCARBAMOYL CHLORIDE
CAS No. 79-44-7
First Listed in the *Second Annual Report on Carcinogens*



CARCINOGENICITY

Dimethylcarbamoyl chloride is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC V.12, 1976; IARC S.4, 1982; IARC S.7, 1987). When applied topically, dimethylcarbamoyl chloride induced skin papillomas (most of which progressed to carcinomas) in female mice. When injected subcutaneously, dimethylcarbamoyl chloride induced local sarcomas in female mice. When administered by inhalation, dimethylcarbamoyl chloride induced carcinomas of the nasal tract in rats and male hamsters.

There are no adequate data available to evaluate the carcinogenicity of dimethylcarbamoyl chloride in humans (IARC V.12, 1976; IARC S.4, 1982; IARC S.7, 1987). A study of workers exposed to dimethylcarbamoyl chloride in which no cases of cancer were reported was considered to be inadequate due to the small number of people observed.

PROPERTIES

Dimethylcarbamoyl chloride is a colorless liquid. It rapidly hydrolyzes in water to dimethylamine, carbon dioxide, and hydrogen chloride. Dimethylcarbamoyl chloride will react with water or steam to produce toxic and corrosive fumes. When heated to decomposition, it emits toxic fumes of hydrogen chloride and other chlorinated compounds as well as nitrogen oxides (NO_x).

USE

Dimethylcarbamoyl chloride is used primarily as a chemical intermediate in the production of dyes, pharmaceuticals, and pesticides. Pharmaceuticals derived from dimethylcarbamoyl chloride (e.g., neostigmine bromide, neostigmine methyl sulfate, and pyridostigmine bromide) are used to treat myasthenia gravis. The three U.S. registered pesticides derived from dimethylcarbamoyl chloride are known by the trade names Tandex® (karbutilate), dimetilan, and Pirimor® (pirimicarb).

PRODUCTION

Chemcyclopedia 98 identifies two U.S. suppliers of dimethylcarbamoyl chloride, and the 1998 *Chemical Buyers Directory* lists one supplier of the compound (Rodnan, 1997; Tilton, 1997). No current producers of the compound were located (SRIa, 1997). Chem Sources identified eight suppliers of dimethylcabamoyl chloride in 1990 (Chem Sources, 1991). The 1979 TSCA Inventory identified two companies that imported 500 lb of this chemical in 1977. The

CBI Aggregate was less than 1 million lb (TSCA, 1979). There was a single domestic producer in 1976 who manufactured less than 1,000 lb per year (IARC V.12, 1976). Production of dimethylcarbamoyl chloride was reported to the U.S. Tariff Commission between 1958 and 1971 (IARC V.12, 1976).

EXPOSURE

The primary routes of potential human exposure to dimethylcarbamoyl chloride are inhalation and dermal contact. Significant potential human exposure to dimethylcarbamoyl chloride is restricted to chemical workers, pesticide formulators, dye makers, and pharmaceutical workers. OSHA estimated that 200 workers are possibly exposed to the chemical. Investigators found concentrations up to 6 ppm dimethylcarbamoyl chloride during the production of phthaloyl chlorides, and levels of exposure may be higher in facilities in which the chemical is used for further synthesis. When it is used in the production of dyes, exposure can occur from residues in the products. According to CPSC, residual levels of trace impurities of dimethylcarbamoyl chloride may be present in the final consumer products. The presence of this potential carcinogen, even as a trace contaminant, is cause for concern, but data describing the actual levels of impurities in the final products and the potential for consumer exposure and uptake are not available.

REGULATIONS

EPA regulates dimethylcarbamoyl chloride under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), and Superfund Amendments and Reauthorization Act (SARA). EPA established a final rule reportable quantity (RQ) of 1 lb under CERCLA. Dimethylcarbamoyl chloride is subject to report/recordkeeping requirements under RCRA and SARA. OSHA regulates dimethylcarbamoyl chloride under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-52.